ABSTRACT

Gas or air filled microbubble and microballoon suspensions in aqueous phases usable as imaging contrast agents in ultrasonic echography. The microbubble suspensions contain laminarized surfactants and, optionally, hydrophilic stabilizers. The laminarized surfactants can be in the form of liposomes. The microbubble suspensions are obtained by exposing the laminarized surfactants to air or a gas before or after admixing with an aqueous phase. The microballoons have a mean size in the range of 0.5 to 1000 microns bounded by a 50 to 500 nm thick polymer membrane. One can impart outstanding resistance against collapse under pressure to these gas-filled microbubbles and gas-filled microballoons used as contrast agents in ultrasonic echography by using as fillers gases whose solubility in water, expressed in liter of gas by liter of water under standard conditions, divided by the square root of the molecular weight does not exceed 0.003.